

UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Egbert Classen et al.
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Group Art Unit: 1792
Examiner: Frankie L. Stinson
Title: DISHWASHER COMPRISING A HEAT TUBE

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Commissioner for Patents
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APPEAL BRIEF

Pursuant to 37 CFR 1.192, Appellants hereby file an appeal brief in the above-identified application. This Appeal Brief is accompanied by the requisite fee set forth in 37 CFR 1.17(f).

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(1) REAL PARTY IN INTEREST

The real party in interest is BSH Bosch und Siemens Hausgeräte GmbH.

(2) RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) STATUS OF CLAIMS

Claims 1-9 are canceled. Claims 10-23 are pending in the present application and have been finally rejected. The final rejection of claims 10-23 is being appealed.

(4) STATUS OF AMENDMENTS

No amendments have been filed since the date of the final Office Action.

(5) SUMMARY OF CLAIMED SUBJECT MATTER

The invention relates to a dishwasher comprising a cleaning container. In particular, a dishwasher 1 includes a washing container 2 where crockery baskets for placing items to be washed are arranged. The dishwasher 1 includes a conduit system 4 connected in an air-conveying manner to the washing container 2. At least one heat tube 10 is used on the one hand for cooling and thereby drying and on the other hand for heating air passed through from the washing container 2. See page 6, lines 9-23.

The washing container 2 has an outlet 3 that leads to the conduit system 4. Both ends 11, 12 of the at least one heat tube 10 protrude from the washing container 2. One of the ends of the heat tube extends into the cold side portion of the conduit system, and the other end of the heat tube extends into the hot side portion of the conduit system. See page 6, line 25 - page 7, line 3.

The conduit system 4 is operable to guide air from the washing basket 2 through the cold side portion 11, whereupon the one end of the heat tube 10 promotes a cooling of air in

the cold side portion 11 of the conduit system 4 with a resultant condensing of moisture out of the cooled air. The heat tube 10 thereafter guides cooled air from the cold side portion 11 to the hot side portion 12, whereupon the other end of the heat tube 10 promotes heating of the air in the hot side portion of the conduit system 4. Thereafter, the conduit system guides the heated air from the hot side portion 12 to the washing container 2. The heat tube 10 operates to conduct heat from its one end extending into the cold portion 11 of the conduit system 4 to its other end extending into the hot portion 12 of the conduit system 4 with the one end of the heat tube 10 receiving heat from air guided therepast at the cold side portion 11 of the conduit system 4 and conducting such received heat to its other end. See page 9, line 7 - page 10, line 13.

Specific Support for Independent Claims

Claim 10 defines a dishwasher having a washing basket and a conduit system connected to the washing basket in an air-guiding manner such that air is guided from the washing basket to the conduit system and air is guided from the conduit system to the washing basket. [See, e.g., page 6, lines 9-23] The conduit system includes a cold side portion and a hot side portion and at least one heat tube having a pair of ends. One of the ends of the heat tube extends into the cold side portion of the conduit system, and the other end of the heat tube extends into the hot side portion of the conduit system. [See, e.g., page 6, line 25 - page 7, line 3] The conduit system is operable to guide air from the washing basket through the cold side portion, whereupon the one end of the heat tube promotes a cooling of air in the cold side portion of the conduit system with a resultant condensing of moisture out of the cooled air, to thereafter guide cooled air from the cold side portion to the hot side portion, whereupon the other end of the heat tube promotes heating of the air in the hot side portion of the conduit system. Thereafter, the conduit system guides the heated air from the hot side portion to the washing container. The heat tube operates to conduct heat from its one end extending into the cold portion of the conduit system to its other end extending into the hot portion of the conduit system with the one end of the heat tube receiving heat from air guided therepast at the cold

side portion of the conduit system and conducting such received heat to its other end. [See, e.g., page 9, line 7 - page 10, line 13]

Claim 19 defines a dishwasher having a washing basket and a conduit system connected to the washing basket in a closed air system such that air is guided from the washing basket to the conduit system and air is guided from the conduit system to the washing basket without outside air input. [See, e.g., page 6, lines 9-23] The conduit system includes a cold side portion and a hot side portion and at least one heat tube having a pair of ends. One of the ends of the heat tube extends into the cold side portion of the conduit system, and the other end of the heat tube extends into the hot side portion of the conduit system. [See, e.g., page 6, line 25 - page 7, line 3] The conduit system is operable to guide air from the washing basket through the cold side portion, whereupon the one end of the heat tube promotes a cooling of air in the cold side portion of the conduit system with a resultant condensing of moisture out of the cooled air, to thereafter guide cooled air from the cold side portion to the hot side portion, whereupon the other end of the heat tube promotes heating of the air in the hot side portion of the conduit system. Thereafter, the conduit system guides the heated air from the hot side portion to the washing container. The heat tube operates to conduct heat from its one end extending into the cold portion of the conduit system to its other end extending into the hot portion of the conduit system with the one end of the heat tube receiving heat from air guided therepast at the cold side portion of the conduit system and conducting such received heat to its other end. [See, e.g., page 9, line 7 - page 10, line 13]

(6) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

- A) Whether claims 10-18 are unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 5,343,632 to Dinh in view of French patent publication 2 491 322 (FR '322) and U.S. Patent No. 5,732,562 to Moratalla.
- B) Whether claims 19-23 are unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 5,343,632 to Dinh in view of UK patent publication 2 059 035, U.S.

Patent No. 3,865,184 to Grover, German patent publication 31 34 506 (German '506) and German patent publication 29 14 859 (German '859).

(7) ARGUMENT

A) *Claims 10-18 are not unpatentable under 35 U.S.C. § 103(a) over Dinh in view of FR '322 and Moratalla.*

The Dinh patent describes a dryer with a closed system that continuously recycles air used to dry materials in the drying compartment without discharging the drying air to the atmosphere. The Dinh system includes a regenerative heat exchanger and an atmospheric cooler/condenser that serve to remove moisture from saturated air drawn from the drying compartment and transfer the heat of condensation back into the air before the air is reheated and recycled back to the materials in the drying compartment. The Office Action recognizes that the conduit system in Dinh lacks the claimed heat tube component of the conduit system.

In this context, however, the Office Action contends that Moratalla discloses “that it is old and well known in a dehumidification system, to provide a heat pipe/tube (185) having a pair of ends, one of the ends (190) of the heat pipe/tube extending into the cold side portion of a conduit system (170) to promote cooling and the other end (255) of the heat pipe/tube extending into the hot side portion of the conduit system to promote heating (255)” Appellants respectfully disagree with this characterization of the Moratalla patent.

Moratalla describes a system for conditioning air using blowers, conduits, a condenser and a heater for generating and regenerating dry air. As shown in Fig. 3, the system includes a heat exchanger 185, which Moratalla describes as “heat pipes, plate-to-plate, rotary heat exchangers, and the like.” Contrary to the contentions in the Office Action, however, even if the heat exchanger 185 is comprised of a heat pipe, Moratalla does not disclose that ends of the heat exchanger respectively extend into a cold side portion of a conduit system and a hot side portion of a conduit system. Rather, the heat exchanger 185 is merely disposed in the conduit path across which the air is passed.

Moreover, although Moratalla references a pre-cooling section 190 of the heat exchanger 185 and a reheated section 255 of the heat exchanger 185, nowhere does Moratalla describe that the heat exchanger 185 is operable to conduct heat from the pre-cooling section 190 to the reheated section 255. Rather, Moratalla utilizes a fluid cooler device 205 adjacent the pre-cooling section 190 of the heat exchanger 185 and a fluid heating device 270 adjacent the reheated section 255 of the heat exchanger 185. Since at least this subject matter is lacking in Moratalla, Appellants submit that for this reason also, the rejection is misplaced.

Still further, the simplified heat tube of the claimed invention is distinguishable from the more complicated heat exchanger structure in the cited references and therefore advantageous from an operational and cost perspective. That is, the heat exchanger in Dinh, for example, includes an evaporator portion 254, a cooler/condenser 256 and a condenser portion 260. The heat exchanger examples referenced in Moratalla similarly include more complicated structure than the claimed heat tube. The condenser in the described embodiments is an optional item and is not part of the heat tube itself. For this reason also, Appellants submit that the rejection of independent claim 10 is misplaced.

Claims 11-18 depend from claim 10 and are allowable for the same reasons and also because they recite additional patentable subject matter. In particular, the dependent claims define additional features of the at least one heat tube, which also are lacking in the cited references.

Reversal of the rejection is respectfully requested.

B) *Claims 19-23 are not unpatentable under 35 U.S.C. § 103(a) over Dinh in view of UK '035, Grover, German '506 and German '859.*

The Office Action recognizes that the conduit system in Dinh lacks the claimed heat tube component of the conduit system. UK '035 is cited for the proposition of a closed-circuit system. Grover discloses the use of a heat tube heat exchanger, DE '506 discloses the use of a heat pipe that transfers heat from one heat exchanger to another, and DE '859 discloses the use of a heat exchanger of a thermal tube type with the tube running from a heat reception side to a heat delivery side. As noted above, however, the simplified heat tube of the claimed

invention is distinguishable from the more complicated heat exchanger structure in the cited references and is therefore advantageous from an operational and cost perspective. Appellants thus respectfully submit that the references of record lack at least the claimed heat tube having a pair of ends respectively extending into the cold side portion and the hot side portion of a conduit system. With regard to dependent claims 20-23, claims 20-23 define additional features of the invention, and Appellants submit that these claims are allowable at least by virtue of their dependency on an allowable independent claim and because they recite additional patentable subject matter.

Reversal of the rejection is requested.

(8) CONCLUSION

In view of the foregoing discussion, Appellants respectfully request reversal of the Examiner's rejection.

Respectfully submitted,

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CLAIMS APPENDIX

1-9. (Canceled)

10. (Rejected) A dishwasher comprising:

a washing basket; and

a conduit system connected to the washing basket in an air-guiding manner such that air is guided from the washing basket to the conduit system and air is guided from the conduit system to the washing basket and the conduit system including a cold side portion and a hot side portion and including at least one heat tube having a pair of ends, one of the ends of the heat tube extending into the cold side portion of the conduit system and the other end of the heat tube extending into the hot side portion of the conduit system and the conduit system being operable to guide air from the washing basket through the cold side portion, whereupon the one end of the heat tube promotes a cooling of air in the cold side portion of the conduit system with a resultant condensing of moisture out of the cooled air, to thereafter guide cooled air from the cold side portion to the hot side portion, whereupon the other end of the heat tube promotes heating of the air in the hot side portion of the conduit system, and to thereafter guide such heated air from the hot side portion to the washing basket and the heat tube operating to conduct heat from its one end extending into the cold portion of the conduit system to its other end extending into the hot portion of the conduit system with the one end of the heat tube receiving heat from air guided therepast at the cold side portion of the conduit system and conducting such received heat to its other end.

11. (Rejected) The dishwasher according to claim 10, wherein the conduit system is operable during at least one drying partial programme section of a washing program that is performed by the dishwasher to guide air from the washing basket into the conduit system and back into the washing basket.

12. (Rejected) The dishwasher according to claim 10, wherein the washing container includes an outlet with a pipe communicated with the at least one heat tube, the at least one heat tube includes a pipe communicating one end thereof with the other end thereof, and the washing container includes an inlet with a pipe communicated with the at least one heat tube and further comprising a fan arranged in the outlet with the pipe communicating the washing basket with the at least one heat tube, the fan being operable to supply at least some of the air in the washing basket to the conduit system at least temporarily.
13. (Rejected) The dishwasher according to claim 10, wherein air from the washing basket is cooled by the at least one heat tube.
14. (Rejected) The dishwasher according to claim 10, wherein air guided by the conduit system from the washing basket into the conduit system is heated by the at least one heat tube.
15. (Rejected) The dishwasher according to claim 12 and further comprising a heater arranged in the pipe of the inlet of the washing basket communicated with the other end of the at least one heat tube.
16. (Rejected) The dishwasher according to claim 12 and further comprising a condenser arranged in the pipe of the outlet of the washing basket and the one end of the at least one heat tube.
17. (Rejected) The dishwasher according to claim 12 and further comprising a condenser arranged in the pipe between the one end of the at least one heat tube and the other end of the at least one heat tube.
18. (Rejected) The dishwasher according to claim 10, wherein the heating and cooling of

the air which is passed through the conduit system takes place at the same time.

19. (Rejected) A dishwasher comprising:

a washing basket; and

a conduit system connected to the washing basket in a closed air system such that air is guided from the washing basket to the conduit system and air is guided from the conduit system to the washing basket without outside air input,

the conduit system including a cold side portion and a hot side portion and including at least one heat tube having a pair of ends, one of the ends of the heat tube extending into the cold side portion of the conduit system, and the other of the ends of the heat tube extending into the hot side portion of the conduit system,

the conduit system being operable to guide air in a closed loop from the washing basket through the cold side portion, whereupon the one end of the heat tube promotes a cooling of air in the cold side portion of the conduit system with a resultant condensing of moisture out of the cooled air, to thereafter guide cooled air from the cold side portion to the hot side portion, whereupon the other end of the heat tube promotes heating of the air in the hot side portion of the conduit system, and to thereafter guide such heated air from the hot side portion to the washing basket,

the heat tube operating to conduct heat from its one end extending into the cold portion of the conduit system to its other end extending into the hot portion of the conduit system with the one end of the heat tube receiving heat from air guided therepast at the cold side portion of the conduit system and conducting such received heat to its other end.

20. (Rejected) The dishwasher according to claim 19, further comprising a heater arranged in the hot side portion of the conduit system.

21. (Rejected) The dishwasher according to claim 19 and further comprising a condenser arranged in the conduit system between the cold side portion and the hot side portion.

22. (Rejected) The dishwasher according to claim 19 and further comprising a condenser arranged between the one end of the at least one heat tube and the other end of the at least one heat tube.

23. (Rejected) The dishwasher according to claim 19, wherein the heating and cooling of the air which is passed through the conduit system takes place at the same time.

EVIDENCE APPENDIX

None

RELATED APPEALS APPENDIX

None